

WHAT IS CLAIMED IS:

1 1. An apparatus for processing a substrate comprising:
2 a plurality of processing chambers;
3 a central transfer chamber housing a first robot in selective
4 communication with the processing chambers; and
5 a load lock comprising,
6 a main chamber including a second robot in selective
7 wafer communication with the first robot through a first slit valve,
8 a first load lock antechamber configured to receive a first
9 wafer batch, the first load lock antechamber in selective wafer
10 communication with the second robot through a second slit valve, and
11 a second load lock antechamber configured to receive a
12 second wafer batch, the second load lock antechamber in selective wafer
13 communication with the second robot through a third slit valve,
14 the first load lock antechamber and the second load lock antechamber in fluid
15 communication with a vacuum pump and selectively evacuable from the main chamber
16 and from each other.

1 2. The apparatus of claim 1 wherein the first load lock antechamber
2 and the second load lock antechamber are oriented linearly with respect to each other in
3 a common plane with the main chamber.

1 3. The apparatus of claim 1 wherein at least one of the first load
2 lock antechamber and the second load lock antechamber are oriented orthogonally with
3 respect to each other in a common plane with the main chamber.

1 4. The apparatus of claim 1 wherein at least one of the first load
2 lock antechamber and the second load lock antechamber are in communication with a
3 pre- or post-processing apparatus selected from the group consisting of a heat source, a
4 gas source, a wafer center-finding apparatus, a wafer orienting apparatus, and a
5 metrology device.

1 5. The apparatus of claim 1 wherein the batch comprises a single
2 wafer provided to the antechamber from a buffering table located outside the tool, the
3 antechamber comprising a support member for receiving the wafer.

1 6. The apparatus of claim 1 wherein the batch comprises a plurality
2 of wafers provided to the antechamber from a buffering table located outside the tool,
3 the antechamber comprising a plurality of shelves for receiving the wafers.

1 7. The apparatus of claim 1 wherein the batch comprises an entire
2 cassette of wafers provided to the antechamber from a buffering table located outside
3 the tool, the antechamber comprising a support member for receiving the cassette.

1 8. The apparatus of claim 1 wherein one of the first and the second
2 robot are selected from the group consisting of a rotatable robot, a shuttle robot, and an
3 arm/knuckle robot.

1 9. A method of processing a substrate comprising:
2 loading a first substrate batch from a buffering table into a first load lock
3 antechamber in selective communication with a main load lock chamber through a first
4 slit valve;
5 utilizing a first robot positioned within the main load lock chamber to
6 transfer a substrate from the first antechamber to the main load lock chamber while a
7 second load lock antechamber in selective communication with the main load lock
8 chamber through a second slit valve is loaded or unloaded with a second substrate
9 batch; and
10 utilizing a second robot positioned within a transfer chamber of the
11 cluster tool in communication with the load lock main chamber and with a processing
12 chamber of the cluster tool, to transfer the substrate from the main load lock chamber to
13 the processing chamber.

1 10. The method of claim 9 further comprising performing a pre- or
2 post- processing step in at least one of the first load lock antechamber and the second
3 load lock antechamber rather than in the processing chamber, thereby maximizing
4 throughput of the processing chamber.

1 11. The method of claim 10 wherein evacuation and venting steps
2 are performed in at least one of the first and second antechambers rather than in the
3 processing chamber.

1 12. The method of claim 10 wherein a gas exposure step is
2 performed in at least one of the first and second antechambers rather than in the
3 processing chamber.

1 13. The method of claim 10 wherein a substrate center-finding step
2 is performed in at least one of the first and second antechamber rather than in the
3 processing chamber.

1 14. The method of claim 10 wherein a metrology step is performed
2 in at least one of the first and second antechambers rather than in the processing
3 chamber.

1 15. The method of claim 10 wherein a substrate orientation step is
2 performed in at least one of the first and second antechambers rather than in the
3 processing chamber.